

AMENDMENTS TO THE CLAIMS

1-5. (Canceled)

6. (Previously Presented) A computer-implemented method for providing a compact layout of connected nodes, comprising:

searching for a deepest non-leaf node along an unsearched path of edges from a root node of a hierarchical configuration of connected nodes, wherein the configuration includes an edge between each pair of connected nodes;

when a deepest non-leaf node is found along the unsearched path, positioning all descendant nodes of the deepest non-leaf node into a first compact layout of connected nodes, wherein the difference between the width and the height of the first compact layout is minimized;

determining whether the deepest non-leaf node has a non-leaf sibling node;

when the deepest non-leaf node has a non-leaf sibling node, positioning all descendant nodes of the non-leaf sibling node of the deepest non-leaf node into a second compact layout of connected nodes, wherein the difference between the width and the height of the second compact layout is minimized;

determining whether a parent node of the deepest non-leaf node is the root node;

when the parent node of the deepest non-leaf node is not the root node, positioning all descendant nodes of the parent node of the deepest non-leaf node, including a sub-tree resulting from the positioning all descendant nodes of the deepest non-leaf node, into a third compact layout of connected nodes, wherein the difference between the width and the height of the third compact layout is minimized;

repeating, for each path of edges from the root node, the foregoing steps of (a) searching for a deepest non-leaf node, (b) positioning all descendant nodes of the deepest non-leaf node, (c) positioning all descendant nodes of a non-leaf sibling node, and (d) positioning all descendant nodes of a parent node;

positioning all descendant nodes of the root node, including all child sub-trees of the root node resulting from the repeating, into a fourth compact layout of connected nodes, wherein the difference between the width and the height of the fourth compact layout is minimized; and
rendering the positioned nodes of the fourth compact layout on an output device, wherein rendering includes depicting each of the positioned nodes and the edge between each pair of connected nodes.

7. (Previously Presented) The computer-implemented method of claim 6, wherein positioning all descendant nodes of the deepest non-leaf node into the first compact layout comprises:

calculating a total area of the all descendant nodes of the deepest non-leaf node;
calculating a preferred width of the first compact layout as the square root of the total area; and
positioning the all descendant nodes of the deepest non-leaf node into the first compact layout wherein the difference between the actual width and the preferred width of the first compact layout is minimized.

8. (Currently Amended) The computer-implemented method of claim 6, wherein positioning all descendant nodes of the non-leaf sibling node of the deepest non-leaf node into the second compact layout comprises:

calculating a total area of the all descendant nodes of the non-leaf sibling node;
calculating a preferred width of the ~~first~~-second compact layout as the square root of the total area; and
positioning the all descendant nodes of the non-leaf sibling node into the second compact layout wherein the difference between the actual width and the preferred width of the ~~first~~-second compact layout is minimized.

9. (Previously Presented) The computer-implemented method of claim 6, wherein positioning all descendant nodes of the parent node of the deepest non-leaf node into the third compact layout comprises:

calculating a total area of all descendant nodes of the parent node, including the area of the sub-tree resulting from the positioning all descendant nodes of the deepest non-leaf node;

calculating a preferred width of the third compact layout as the square root of the total area; and

positioning the all descendant nodes of the parent node into the third compact layout wherein the difference between the actual width and the preferred width of the third compact layout is minimized.

10. (Previously Presented) The computer-implemented method of claim 6, wherein positioning all descendant nodes of the root node into the fourth compact layout comprises:

calculating a total area of all descendant nodes of the root node, including the area of each child sub-tree of the root node resulting from the repeating;

calculating a preferred width of the fourth compact layout as the square root of the total area; and

positioning the all descendant nodes of the root node into the fourth compact layout wherein the difference between the actual width and the preferred width of the fourth compact layout is minimized.

11-16. (Canceled)

17. (Previously Presented) A computer-readable storage medium having computer-executable instructions for providing a compact layout of connected nodes, the instructions implementing a method comprising:

receiving an input of data representing a hierarchical configuration of connected nodes, wherein the configuration includes a branch between each pair of connected nodes;

locating a deepest internal node along an unsearched path of branches from a root node of the hierarchical configuration of connected nodes;
arranging all descendant nodes of the deepest internal node into a first compact layout of connected nodes, wherein the ratio between the width and the height of the first compact layout is optimized toward a first preferred aspect ratio;
arranging all descendant nodes of a parent node of the deepest internal node, including a sub-tree formed by the deepest internal node and the first compact layout, into a second compact layout of connected nodes, wherein the ratio between the width and the height of the second compact layout is optimized toward a second preferred aspect ratio;
arranging all descendant nodes of the root node, including all resultant child sub-trees of the root node, into a third compact layout of connected nodes wherein the ratio between the width and the height of the third compact layout is optimized toward a third preferred aspect ratio; and
rendering the arranged nodes of the third compact layout on an output device, wherein rendering includes depicting each of the arranged nodes and the branch between each pair of connected nodes.

18. (Previously Presented) The computer-readable medium of claim 17, further comprising:

receiving a selection of the first, second, and third preferred aspect ratios for the ratio of the width to the height of the first, second, and third compact layouts, respectively;
receiving a selection of a layout format for the first, second, and third compact layouts, wherein the layout format determines a routing of the branches to the connected nodes; and
receiving a selection of a preferred spacing for the connected nodes and the branches within the first, second, and third compact layouts.

19. (Currently Amended) The computer-readable medium of claim 17, wherein ~~the logic for~~ arranging all descendant nodes of the deepest internal node into the first compact layout comprises:

- calculating a total area of the all descendant nodes;
- calculating a preferred width of the first compact layout as the square root of the total area; and
- arranging the all descendant nodes into the first compact layout wherein the difference between the actual width and the preferred width of the first compact layout is minimized.

20. (Currently Amended) The computer-readable medium of claim 17, wherein ~~the logic for~~ arranging all descendant nodes of the parent node of the deepest internal node comprises:

- calculating a total area of all descendant nodes of the parent node, including the area of the sub-tree formed by the deepest internal node and the first compact layout;
- calculating a preferred width of the second compact layout as the square root of the total area; and
- arranging the all descendant nodes of the parent node into the second compact layout wherein the difference between the actual width and the preferred width of the second compact layout is minimized.

21. (Currently Amended) The computer-readable medium of claim 17, wherein ~~the logic for~~ arranging all descendant nodes of the root node comprises:

- calculating a total area of all descendant nodes of the root node, including the area of each resultant child sub-tree of the root node;
- calculating a preferred width of the third compact layout as the square root of the total area; and
- arranging the all descendant nodes of the root node into the third compact layout wherein the difference between the actual width and the preferred width of the third compact layout is minimized.